

SYSTEMATICS OF THE INTERTIDAL TRAPDOOR SPIDER GENUS *IDIOTIS*  
(MYGALOMORPHAE: BARYCHELIDAE) IN THE WESTERN PACIFIC WITH A NEW  
GENUS FROM THE NORTHEAST

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The circum-tropical trapdoor spider genus *Idiopsis* included 6 species from Madagascar, east to Hawaii. A new genus, *Nihoa*, endemic to the Leeward Islands, north of Hawaii, is named and now includes *Idiopsis hawaiiensis* Raven, 1988, endemic to Necker Island, and a further new species, *Nihoa mahina* sp. nov., endemic to Nihoa Island. Four new species of *Idiopsis* from the Western Pacific are described: *I. yerlata* from north-eastern Australia; *I. ferrophila* from New Caledonia; *I. marovo* from the Solomon Islands; and *I. talofa* from Western Samoa, raising the number of species to nine. For the first time, the male of the type species *I. helva* Koch, 1874, from Fiji, is described. Variation in the shape of spermathecae in *Idiopsis* is described. □ *Chelicerata, Mygalomorphae, Barychelidae, systematics, phylogeny.*

Tracey B. Churchill and Robert J. Raven, Queensland Museum, PO Box 3300, South Brisbane, Queensland 4101, Australia; 3 February, 1992.

Spiders of a number of genera occur beside the sea. However, only few are intertidal in that their burrows are covered at high tide. Best known among araneomorphs are *Desis* and *Paratheuma* (Desidae), the latter having been revised recently (Beatty and Berry, 1988). In contrast, spiders of only one mygalomorph genus, *Idiopsis* Koch, 1874, are known to live in the intertidal zone.

The genus *Idiopsis* was first described by Koch (1874) including only *I. helva* from Fiji. No reference was made to the habitat. The first report of the intertidal habits of a barychelid was with the description of *Idiopsis littoralis* Abraham, 1924, found in the intertidal mudflats of Singapore. Much later, *I. helva* was recorded from the littoral zone in Western Samoa (Marples, 1951, 1955). Soon after, another species, *Atrophonysia intertidalis* Benoit & Legendre, 1968, (transferred to *Idiopsis* by Raven, 1985) was collected and described from the littoral zone of Madagascar and the Seychelles.

By 1988, six species of *Idiopsis* had been described: the type species, *I. helva* from Fiji and Western Samoa (Marples, 1951, 1955); *I. littoralis* Abraham, 1924 from Singapore; *I. intertidalis* (Benoit & Legendre, 1968) from Madagascar and the Seychelles (Benoit, 1978); *I. xmas* Raven, 1988 from Christmas Island; *I. entiwetok* Raven, 1988 from the Caroline and Marshall Islands; and *I. hawaiiensis* Raven, 1988 from the Leeward Islands, near Hawaii.

After a revision of the genus (Raven, 1988), we discovered *Idiopsis* in the intertidal or littoral zones in northern Australia, New Caledonia, and

the Solomon Islands. Three new species are described here. Concurrently, the first male and more females of the type species, *I. helva*, were taken from the type-locality of Ovalau, a small island of Fiji. Females of *I. helva* were also collected from the coast of the large island of Vanua Levu, Fiji. With this new material we conclude that a new species occurs in Western Samoa. We also document variation in spermathecae for the first time in barychelids.

Raven (1988) noted that *Idiopsis hawaiiensis* differed from all other congeners in the wider sternum, undivided spermathecae, and relatively shorter eye group. Since then, material from another island in the Leeward Islands has proved to be a new species for which a new genus is here created. This new genus recognizes the plesiomorphic nature of both *I. hawaiiensis* and its new sister species.

#### MATERIALS AND METHODS

All abbreviations are standard for the Araneae and explained in Raven (1984a). The width of the eye group or the median ocular quadrangle (abbreviated as MOQ) is the distance between the two most separated points in a line orthogonal to the long axis of the spider. All measurements except those for eyes are given in millimetres. Eye measurements are taken from camera lucida drawings made at  $\times 50$  magnification; any error was taken as 0.02 mm, or 1mm on the enlarged figure. Eye interspaces, which are measured along a line joining the centres of the respective eyes, are given as

diameters of an AME. Presence of leg spines are specified by the number recorded with their position (rare number occurring in parentheses) although ranges can include zero. Spine positions are as follows: dorsal, if on or close to the midline; pro- or retrolateral, if spine bases are visible pro- or retrolaterally when viewed dorsally; ventral, if bases are visible when viewed ventrally. Spines are considered weak, and probably the equivalent of attenuate macrosetae of Coyle (1971: 329), if only marginally thicker than other setae on that surface. Despite being weaker, they are treated as spines because their number and position suggest they are the weaker form of thick spines on other species. Descriptions of scopulae give the extent (measured from the distal end of the leg segment), the density of scopula hairs, and the number of rows of setae that part the scopula hairs.

Acronyms for museums are: AMNH, American Museum of Natural History, New York; BMNH, British Museum (Natural History), London; NHW, Naturhistorisches Museum, Vienna; QM, Queensland Museum, Brisbane. Other museums are given in full.

## SYSTEMATICS

### *Idioctis* Koch

*Idioctis* Koch, 1874: 484 (type species by monotypy *Idioctis helva* L. Koch). Simon, 1892: 125; 1903: 914. Rainbow, 1912: 115. Roewer, 1942: 214. Bonnet, 1957: 2286. Brignoli, 1983: 129. Main, 1985: 12. Raven, 1985: 113; 1988: 2. Platnick, 1989: 93.

*Atrophonysia* Benoit & Legendre, 1968: 330 (type species by original designation *Atrophonysia intertidalis* Benoit & Legendre). First synonymized by Raven, 1985: 113. Brignoli, 1983: 130. Raven, 1985: 113, 1988: 2; Platnick, 1989: 93.

### DIAGNOSIS

*Idioctis* can be distinguished from *Idiophthalma* by the narrow sternum and narrow fovea and absence of a strong rastellum, and from other barychelid genera by the relatively short but strongly trapezoidal eye group and a narrow sternum. It is also readily distinguished from *Niho* gen. nov. and many other barychelids in the pallid pattern-free abdominal dorsum and the elongate sternum.

### DESCRIPTION

Carapace hirsute, without pattern. Fovea very broad, procurved or straight. Abdomen pallid, without pattern. Rastellar spines few in line over-

hanging fang, not on raised mounds. Maxillae usually with c. 18-20 cuspules on inner anterior corner; anterior lobe and posterior heel produced. Labium wide, without cuspules. Sternum long, narrow (about 1.5 times longer than wide, rarely wider), with small, marginal sigilla, if evident. Scopulae (♀♀) entire on metatarsi and tarsi I and II; for full length of prolateral face of metatarsi III and only rarely present elsewhere on segment; widely parted by setae on tarsi III; only narrow lateral bands of hair, if present, on tarsi IV; absent on metatarsi IV. Scopuliform brush present on the proventral face of tibiae I and II of ♀♀. Spines. Leg 1: fe d0-4; ti p0-1 v2-7; me r0-1. Leg 2: fe d0-4; ti p0-1 v0-4; me v1-2. Leg 3: fe p0-1, d0-5; pa p6-30; ti p(2), r(2), v0-7; me p0-3, r0-3, v0-13. Leg 4: fe d0-7; pa p3-16; ti r(2), v0-7; me p0-7, r0-4, v2-9. Paired claws of ♀♀ with teeth on lateral face (Fig. 3); claws of ♂♂ biserially dentate. Tarsi with clavate and filiform trichobothria. ♂♂: tibia I with prolateral spur and megaspine, more distal prolateral megaspine and associated cuticular 'thumb'; palpal bulb pyriform. Intertidal, rarely in forests.

### CHECKLIST OF SPECIES

- Idioctis helva* Koch, 1874, type species Fiji.  
*Idioctis eniwetok* Raven, 1988 Caroline & Marshall Islands.  
*Idioctis ferrophila* sp.nov. New Caledonia.  
*Atrophonysia intertidalis* Benoit & Legendre, 1968 Madagascar, Seychelles.  
*Idioctis littoralis* Abraham, 1924 Singapore.  
*Idioctis marovo* sp.nov. Solomon Islands.  
*Idioctis talofa* sp.nov. Western Samoa.  
*Idioctis xmas* Raven, 1988 Christmas I., Australia.  
*Idioctis yerlata* sp.nov. North-eastern Australia.

### DISTRIBUTION

Spiders of the genus *Idioctis* are now known near beaches and in littoral zones in Fiji, Singapore (Abraham, 1924), Western Samoa (Marples, 1951, 1955), Madagascar (Benoit & Legendre, 1968), Seychelle Islands (Benoit & Legendre, 1968), Christmas Island (Indian Ocean, Raven, 1988), Marshall and Caroline Islands (Raven, 1988), north-eastern Australia, New Caledonia and the Solomon Islands. Habitats, life history observations and biogeography of the genus will be discussed elsewhere.

### REMARKS

This paper contains the first description of a ♂ of the type species. The diagnosis of *Idioctis* given by Raven (1988) is correct save for the removal of

characters present only in *I. hawaiiensis*, here transferred to *Niho*, gen. nov.

***Idioctis helva* Koch**  
(Figs 2-6, Table 1)

*Idioctis helva* L. Koch, 1874: 484, tab. 37, fig. 3 a,b.  
Hogg, 1901: 241-242, fig. 26a. Marples, 1955: 453-454; Raven, 1988: 4, figs 1-5.

**MATERIAL EXAMINED**

LECTOTYPE: ♀, (here designated), Ovalau I., 17°41'S, 178°50'E, Fiji, Mus. Godeffroy No. 8097, deposited in Zoologische Institut and Zoologisches Museum, Hamburg.

PARALECTOTYPES: 1 ♀, 1 juvenile, same data, deposited in BMNH.

**OTHER MATERIAL**

TOPOTYPES: 1 ♂, Nageledamu, Ovalau I., 17°41'S, 178°50'E, Fiji, in mangrove root, 14.xi.1988, T.B. Churchill, QM S11229. 5 ♀ ♀, Nageledamu, Ovalau I., Fiji, 14.xi.1988, T.B. Churchill, QM S12521-5; 6 ♀ ♀, Lotu I., Vanua Levu, 16°46'S, 179°20'E, Fiji, 20.x.1988, T. B. Churchill, QM S12526-30.

**DIAGNOSIS**

Spermathecae two, each consisting of two short

TABLE 1. Leg measurements of *Idioctis helva*, ♂.

	I	II	III	IV	Palp
Femur	3.60	3.20	2.56	3.36	2.20
Patella	1.92	1.84	1.44	1.76	1.44
Tibia	3.04	2.64	2.16	3.52	1.52
Metatarsus	2.32	2.16	2.16	2.96	
Tarsus	1.36	1.28	1.20	1.20	0.84
Total	12.24	11.12	9.52	12.80	6.00

dissimilar lobes, ental lobe stout, ectal lobe slender. ♀ ♀ with c.18 thorns on patella III. 4-5 teeth on paired claws of ♀ ♀. Rastellum of ten thick (four as long as wide) coniform spines in short distal line. Preening combs absent. ♂ ♂. Tibia I with small distal spur and upcurved megaspine, prolateral face with distal triangular cuticular process and short lower angular downcurved spine. Bulb pyriform; embolus broad, not spiralled; cymbium with two divided lobes. Two rows of teeth on all paired claws.

**TOPOTYPE MALE**

Carapace 4.36 long, 3.32 wide. Abdomen 4.16 long, 2.40 wide. Total length, 10.

*Colour in alcohol.* Carapace and legs yellow brown, chelicerae red brown; abdomen dorsally grey brown with dark 'V' dorsally showing location of heart; venter entirely yellow brown.

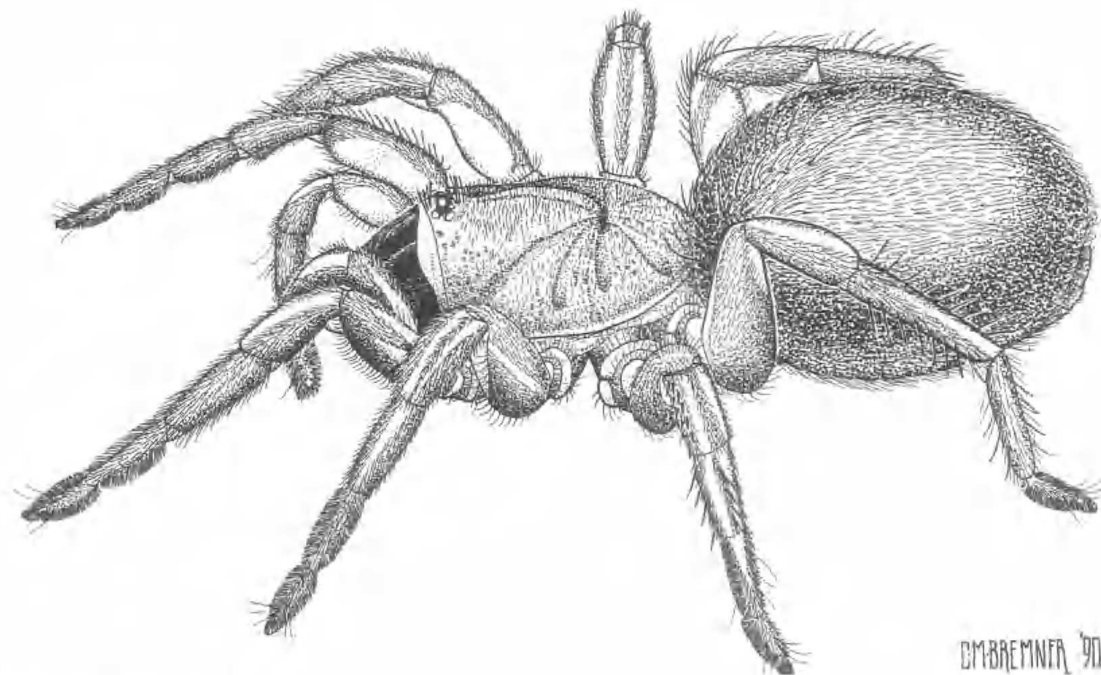


FIG. 1. *Idioctis yerlata* sp.nov., ♀.

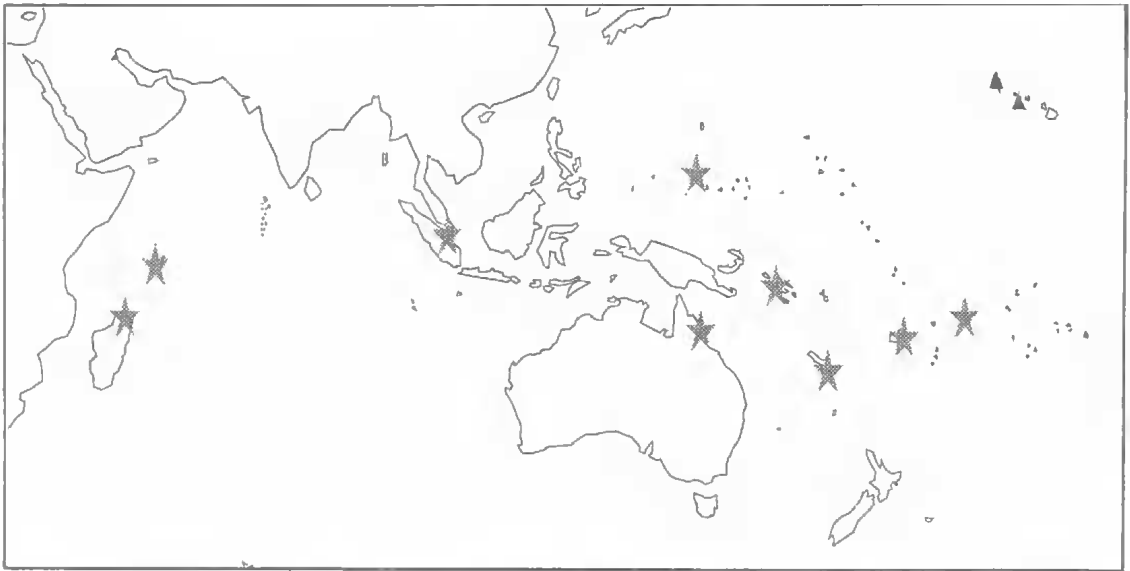


FIG. 2. Distribution of *Idioctis* ★ and *Nihoa* ▲ in the Western Pacific and Indian Ocean.

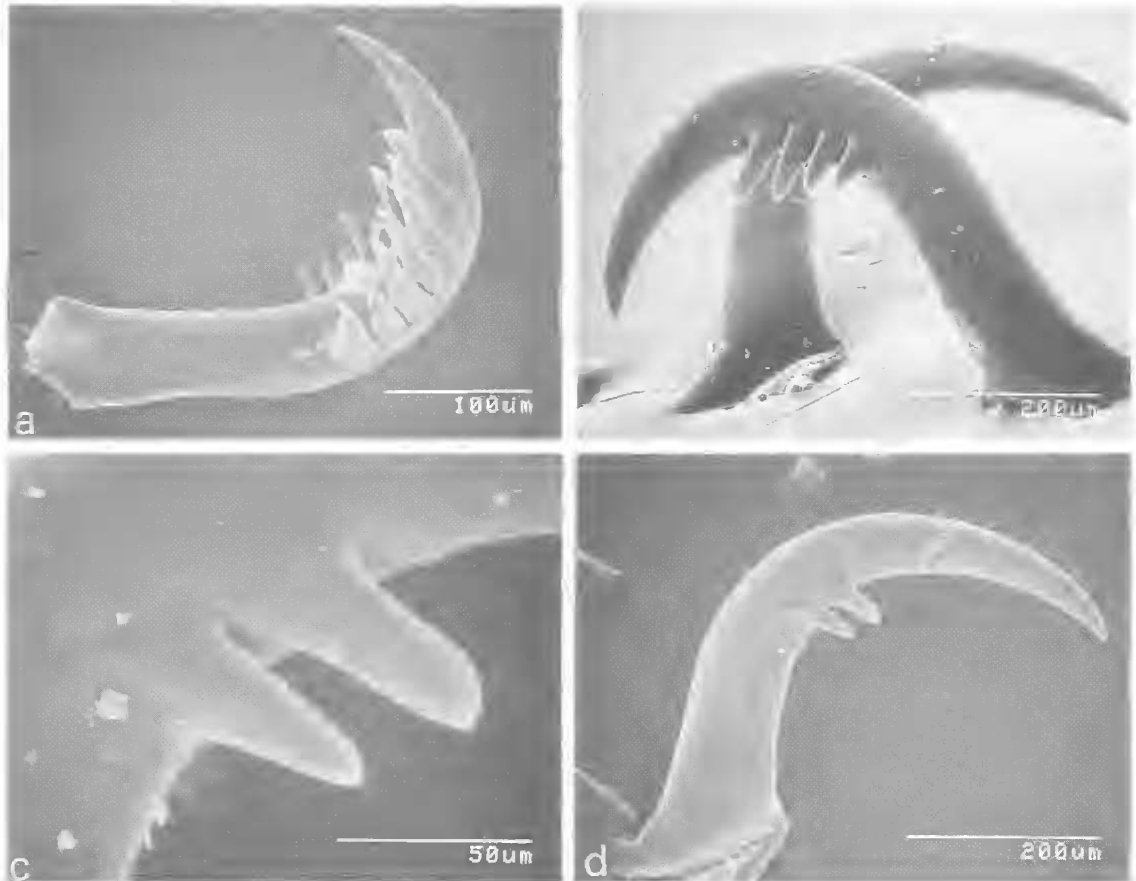


FIG. 3. *Idioctis helva*, scanning electron micrographs, paired claws, lateral view. a, b, leg I, ♂ (a), ♀ (b). c, d, leg IV, ♀.

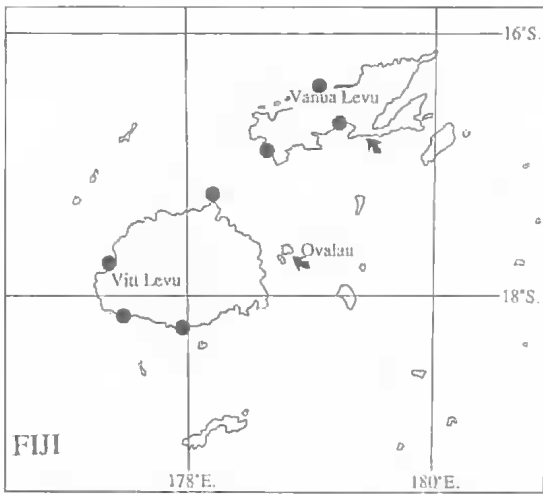


FIG. 4. Presence ■ and absence ● of *Idioctis helva* at coastal localities sampled in Fiji.

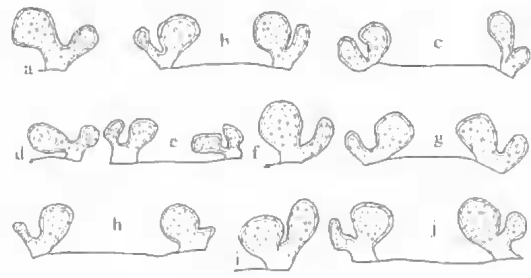


FIG. 5. *Idioctis helva*, dorsal view of spermathecae of ♀♀. a-d, g, Ovalau Island, Fiji. a, S12525. b, S12521. c, S12522. d, S12523. g, S12524. e, f, h-j, Lotu Island (Vanua Levu), Fiji. e, S12527. f, S12528. h, S12526. i, S12529. j, S12530. Scale line = 0.25mm.

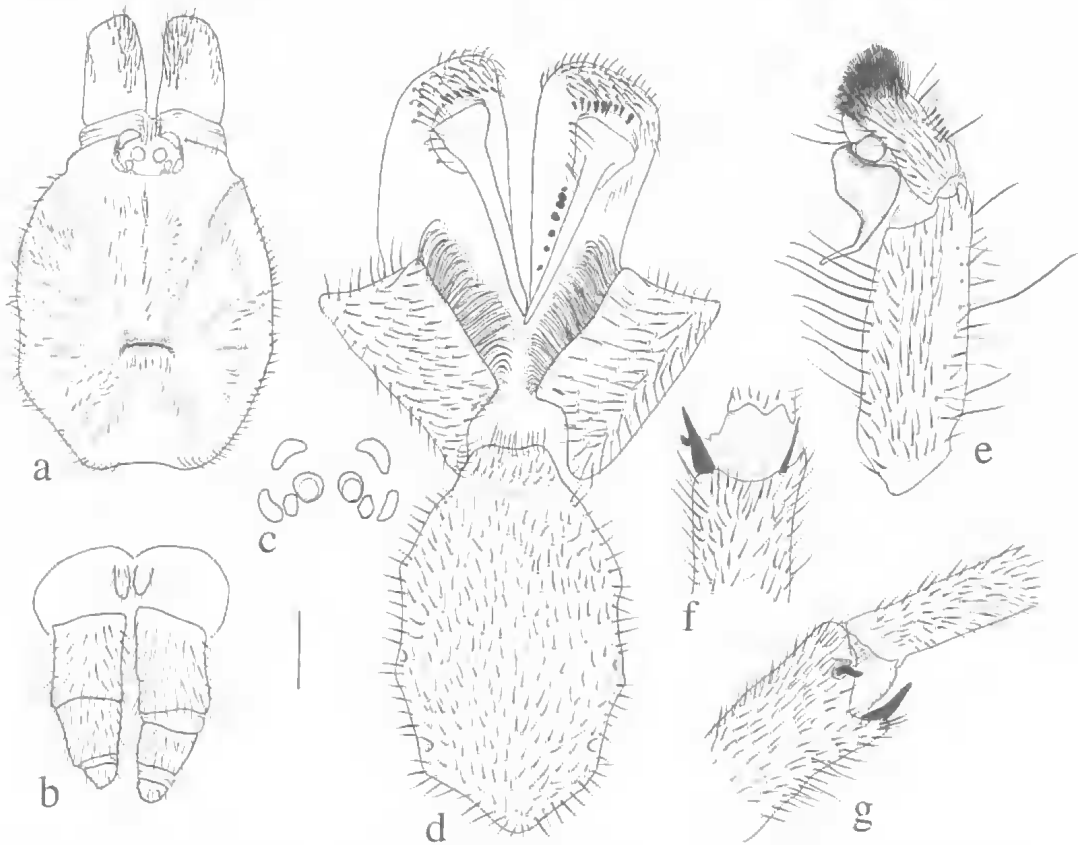


FIG. 6. *Idioctis helva*, topotype ♂. a, cephalothorax and chelicerae, dorsal view. b, spinnets, ventral view. c, eyes, dorsal view. d, sternum, maxillae, labium and chelicerae, ventral view. e, palpal tibia, cymbium, and bulb, retroventral view. f, tibia I, ventral view, showing distal spur and megaspine. g, tibia I showing spur, prolateral view. Scale line = 1mm (a), 0.5mm (b-g).

**Carapace.** Uniform covering of short black bristles and fine grey hair, not obscuring cuticle; margins with longer setae and lower sclerotised shelf of hirsute chitin below main margin. An irregular row of 15-20 setae anteromedially; 2-3 pairs of fine setae; numerous thick setae between PME and ALE. Striae shallow, narrow, glabrous, recognised as areas intervening grey bush of hair. Fovea wide, recurved.

**Eyes.** Tubercle distinct. Group occupies 0.45 of head-width. Three rows; back row recurved. Front line of lenses of AME just behind line of back of ALE and 'iris' well back. Eye group front width, back width, length = 35:43:25. MOQ front width, back width, length = 21:29:14. AME:ALE:PME:PLE = 10:11:7:10. Eye interspaces: AME-AME, 0.5; AME-ALE, 0.5; ALE-ALE, 1.6; PME-PLE, 0.2; PME-PME, 1.8; ALE-PLE, 0.6.

**Chelicerae.** Wide band of brown setae and grey hair prodorsally, two narrower bands laterally. Promargin with 8 evenly spaced teeth, basomesally with 2 small teeth and 3 granules. Intercheliceral tumescence absent. Rastellum consists of 5 long thick pointed spines and c.5 thick setae.

**Labium.** 0.64 wide, 0.28 long. Cuspules absent. Labiosternal suture is two sigilla narrowed at their medial junction.

**Maxillae.** 1.04 long in front, 1.36 long behind, 0.64 wide; with c.5-8 pointed cuspules. Heel angular; anterior lobe distinct.

**Sternum.** 2.16 long, 1.48 wide. Only posterior sigilla evident as rounded glabrous marginal areas.

**Legs.** Formula 4123. All segments, especially femora, with mat of dark grey prostrate hairs; and erect black setae. All legs of similar diameter. Tibia I with small distal spur and upcurved megaspine, prolateral face with distal triangular cuticular process and short lower angular downcurved spine. Preening combs entirely absent.

**Scopula.** Never so thick as to obscure cuticle, individual hair bases distinct. Tarsi I-III ventrally pallid. Tarsi I and II entirely ventral, thin, entire, full length; III, thin, divided by 8-10 setae; IV, with 10-15 scopula hairs in narrow triangle on proximal prolateral face. Claw tufts smaller than claws. Metatarsi: I, thin for full length, distally cuticle is pallid; II, similar but with single thick seta on ventrodistal edge; III, proventrally with light brush; IV, bare. Thorn spines: 10 on prolateral patella III.

**Spines.** Leg 1: fe d4, ti v3 +2 megaspines; me v1 weak, distal. Leg 2: fe d3, ti v4; me v1 weak, distal. Leg 3: fe d4, r1, pa p10 thorns, ti v5, me r1, v4.

Leg 4: fe d6, r1w; ti r2, v7w; me v3 + 4 thick setae. Palp: fe d5w.

**Claws.** 2 full scooped rows of 8-10 teeth in each row on paired claws of leg I; claws of leg IV with 2 rows, 6 in each outer row and 2 in each inner row.

**Trichobothria.** In two rows, each of c.8 for 3/4 of tibiae; c.12 in proximally retrolateral row on metatarsi, distally row is irregular and trichae are longer; c.3 clavate and 15 filiform on tarsi in band.

**Palp.** Bulb pyriform; embolus broad, not spiralled; cymbium with two divided lobes.

**Spinnerets.** PMS 0.20 long, 0.08 wide, 0.08 apart, c.0.18 of basal PLS in diameter. PLS basal, middle, apical, and total article lengths = 0.64, 0.26, 0.14, 1.04, respectively.

#### DISTRIBUTION AND HABITAT

*I. helva* is known from mangrove roots and trunks on Ovalau Island, east of Viti Levu, Fiji, and from coral rock on Lotu Island, south of Vanua Levu, Fiji.

#### REMARKS

Females of *I. helva* differ from those of other species by the wider configuration of the eyes and the smaller PMS. Spermathecae consist of two short almost amorphous lobes joined basally to form a common aperture. Males differ from those of *I. enivetok* Raven by the absence of preening combs.

#### *Idioctis yerlata* sp. nov. (Figs 1, 2, 7-9, Table 2)

#### MATERIAL EXAMINED

**HOLOTYPE:** ♀, Cape Tribulation, 16°05'S, 145°26'E, in mangroves, North Queensland, Australia, 28-29.viii.1988, R.J. Raven, T.B. Churchill, J.A. Gallon, QM S7213.

**PARATYPES:** 7♀♀, Cape Tribulation, 16°05'S, 145°26'E, in mangroves, North Queensland, 28-29.viii.1988, R.J. Raven, T.B. Churchill, J.A. Gallon, QM S7204-9, S7212, S11181. 1♀, Noah Head, S. of Cape Tribulation, 16°08'S, 145°28'E, 30.viii.1988, R.J. Raven, T.B. Churchill, J.A. Gallon, QM S7206.

#### DIAGNOSIS

Spermathecae with one large medial lobe and variable basal lobe ectally; basal lobe small with common atrium with lateral lobe or separate lobe arising above base of medial lobe (Fig. 9). Three closely spaced teeth on cheliceral promargin near fang base. Numerous (28-30) thorn spines on prolateral patellae III. 5-7 teeth on paired claws of

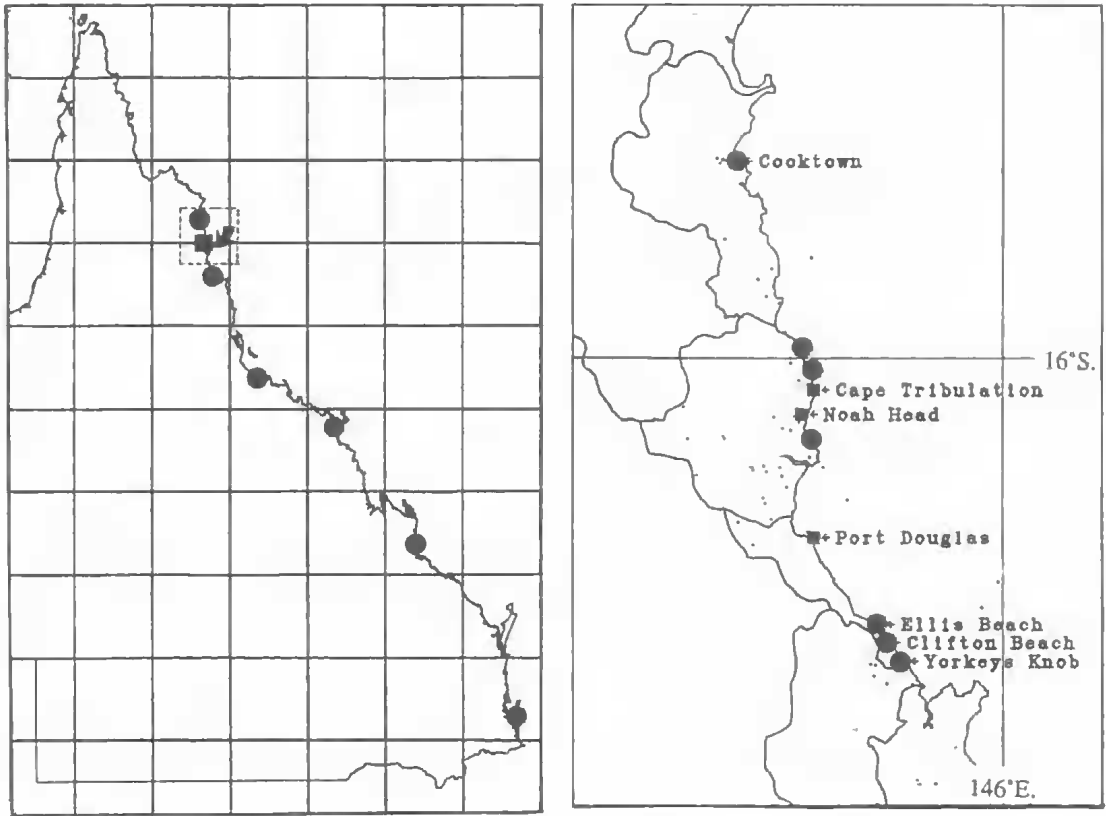


FIG. 7. Presence of *Idioctis yerlata* sp. nov. at coastal localities sampled in Queensland, Australia; inset enlarged at right, presence ■ and absence ●.

leg I. Preening combs absent. Rastellum is 12-14 long curved spines.

HOLOTYPE FEMALE

Carapace 5.36 long, 4.40 wide. Abdomen 8.80 long, 5.28 wide. Total length, 16.

*Colour in alcohol and life.* Carapace and legs yellow brown, chelicerae red brown, abdomen uniform yellow brown.

*Carapace.* Uniform cover of fine prostrate wavy grey hairs; 10-15 long erect setae on medial caput lateral of centre line; c.4 pairs of fine foveal bristles; 27 long erect black setae anteromedially;

7 long black anteriorly directed bristles and numerous fine black setae between PME; 2 long recurved and 10-15 shorter black bristles between ALE; caput raised; striae distinct. Fovea broad, straight with recurved ends.

*Eyes.* Tubercle low. Group occupies 0.33 of head width. Three rows; back row more or less straight. Eye group front width, back width, length = 44:58:34. MOQ front width, back width, length = 23:42:17. AME:ALE:PME:PLE = 7:13:7:15. Eye interspaces: AME-AME, 1.3; ALE-ALE, 3.4; AME-ALE, 1.6; PME-PLE, 0.1; PME-PME, 4.0; ALE-PLE, 1.6.

*Chelicerae.* With moderately dense bush of black hairs dorsally and in lateral band; rastellum consists of 12-14 long strong spines; promargin of furrow with two very large and five smaller teeth, and six small teeth basally.

*Labium.* 0.92 wide, 0.48 long, without cuspules, separated from sternum by narrow groove.

*Maxillae.* 1.60 long in front, 2.04 long behind, 0.96 wide; with 6-9 spindle-shaped cuspules in

	I	II	III	IV	Palp
Femur	3.28	2.88	2.24	3.44	2.64
Patella	2.48	2.32	1.84	2.64	1.84
Tibia	2.48	2.24	1.84	3.44	1.64
Metatarsus	1.84	1.76	1.12	2.80	
Tarsus	1.36	1.20	0.88	1.20	1.52
Total	11.44	10.40	7.92	13.52	7.64

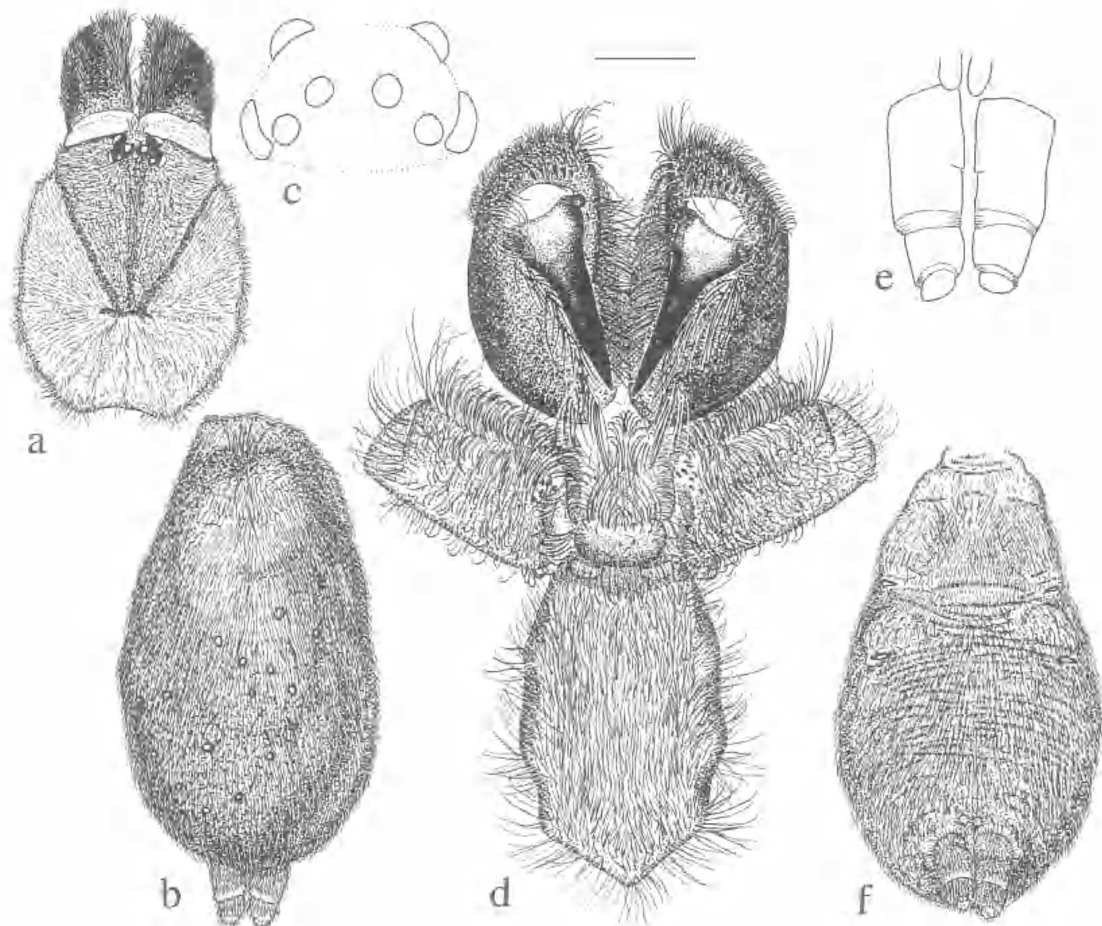


FIG. 8. *Idioctis yerlata* sp. nov. holotype ♀. a, cephalothorax and chelicerae, dorsal view. b, abdomen, dorsal view. c, eyes, dorsal view. d, sternum, maxillae, labium and chelicerae, ventral view. e, spinnerets, ventral view. f, abdomen, ventral view. Scale line = 2 mm (a, b), 1mm (d), 0.5mm (c, e).

close group on inner angle; anterior lobe indistinct, posterior 'heel' produced.

**Sternum.** 3.12 long, 2.00 wide; sigilla evident as shallow depressions in margin.

**Legs.** Formula 4123. Legs I and II much thicker than III and IV; tarsi as fat as distal metatarsi. Dorsal tarsi and metatarsi with pile of short straight grey hair. Tibia through tarsus IV asetose, almost glabrous. With numerous short coniform spines on prolateral patellae III, IV. Preening combs consist of group of 8 spines on metatarsi III, outer pair and middle pair long and slender, others short, thick; eight also on metatarsi IV, two long slender setae separated by shorter spines on ventral edge of metatarsi IV.

**Scopula.** Full and entire on metatarsi and tarsi I, II; divided by setae on metatarsi and tarsi III; one

narrow prolateral band on tarsi IV; elsewhere absent. Palpal tarsal scopulae entire.

**Spines.** No spines on tarsi. Leg 1: fe 0, (d11 (thick setae); ti p1 weak, v7 weak; me v1 distally with thick bristle. Leg 2: me v2 distally 1v with thick bristle. Leg 3: pa p28-30; tibia v1 + 6w, me dis-toventral 2 long medial with 4 on each side and one between 2 long. Leg 4: fe 0, pa p11-16, ti v5, me 0. Palp, ti v1 or v0.

**Claws.** Paired claws with 5-7 teeth on ectally displaced keel on leg I; 3 teeth on leg III; 2 on leg IV; palpal claw without teeth. All paired claws extending beyond tufts, except on palp.

**Trichobothria.** c.8 for  $\frac{3}{4}$  of tibiae; c.12 on metatarsi; 5 clavate and 12 filiform on tarsi.

**Spermathecae.** Two, each with one large medial and one ectal lobe.



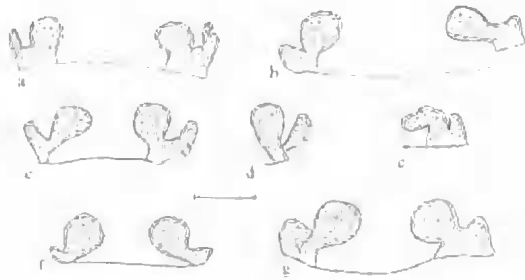


FIG. 9. *Idioctis yerlata* sp.nov., dorsal view of spermathecae of ♀♀. a, S7204. b, S7207. c, S7212. d, S7213. e, S11181. f, S7206. g, S7208. Scale line = 0.25mm.

*Spinnerets.* PMS 0.48 long, 0.22 wide, bases 0.10 apart, c.0.24 of basal PLS in diameter. PLS basal, median, and apical total article lengths = 1.14, 0.60, 0.20, 1.94, respectively.

**DISTRIBUTION AND HABITAT**

Known only from mangroves and loose coral rubble in the intertidal zone near Cape Tribulation, north Queensland, Australia. A trapdoor burrow like that of *Idioctis* was noted in the intertidal zone on a mangrove tree just south of Port Douglas, about 30km north of Cairns, north Queensland.

**ETYMOLOGY**

The specific epithet is an aboriginal work meaning oyster, which is often the impression conveyed by the door of *I. yerlata* burrows.

**REMARKS**

Females differ from all species of *Idioctis* in the larger relative size (3.4 times an AME diameter) of the ALE-ALE interspace.

***Idioctis ferrophila* sp.nov.**  
(Figs 2, 10-12, Table 3)

**MATERIAL EXAMINED**

**HOLOTYPE:** ♀, Port Boisé, 22°20'S, 166°59'E, New Caledonia, ironstone boulder in water on beach, 25.x.1988, R.J. Raven, T.B. Churchill, QM S13537.

**PARATYPES:** 7 ♀♀, Port Boisé, 22°20'S, 166°59'E, New Caledonia, ironstone boulder in water on beach, 25.x.1988, R.J. Raven, T.B. Churchill, QM S12511-3, S12515-7, S13538; 3 ♀♀, same data, 6.ix.1990, P. Gotoboff, N. Platnick, R.J. Raven, AMNH.

**DIAGNOSIS**

Spermathecae with large medial lobe and short basal lobe with axes perpendicular. Thorn spines: c.30 on prolateral patellae III, c.11 small on

proximal prodorsal patella IV. 3-5 teeth on paired claws of ♀♀. Rastellum a line of 10 short conical spines, not on mound, on edge above fang. ♂♂ unknown.

**HOLOTYPE FEMALE**

Carapace 5.28 long, 4.12 wide. Abdomen 8.48 long, 4.88 wide. Total length, 17.

*Colour in alcohol and life.* Carapace yellow brown with light brown mottling, chelicerae dark reddish brown-burgundy; legs, sternum, maxillae, and labium yellow brown; abdomen light yellow brown with slightly darker medial band over heart.

*Carapace.* With fine gray hairs forming uniform covering; hairs become larger and paler on margins and darker and thicker near anteromedial line. Striae glabrous, narrow, barely distinct. Narrow sclerotised and hirsute ledge below edge of carapace. Fovea very slightly procurved. About 10 thick and several finer anteromedial setae; two long setae between PME; 5-8 long recurved and several shorter setae and fine hairs between ALE. Clypeus absent.

*Eyes.* Tubercle low. Group occupies 0.32 of head-width. Three rows; back row procurved. Eye group front width, back width, length = 44:55:32. MOQ front width, back width, length = 25:33:19. AME:ALE:PME:PLE = 10:14:8:14. AME-AME, 0.4, AME-ALE, 0.8, ALE-ALE, 1.7, PME-PLE, 0.3, PME-PME, 2.2, ALE-PLE 1.0.

*Chelicerae.* Porrect with prodorsal and lateral bands of long fine hairs. Slight ridge parallels upper cheliceral face. Rastellum a line of 10 short conical spines, not on mound, on edge above fang.

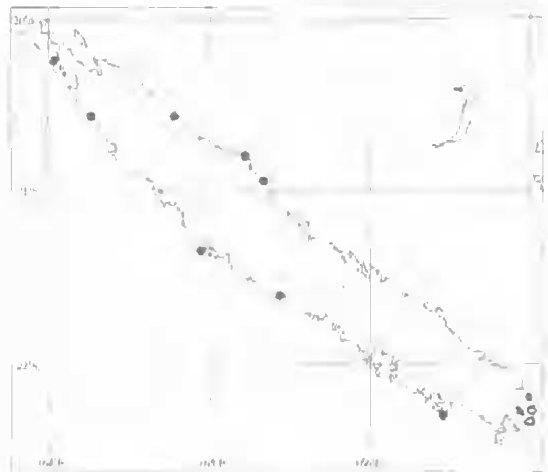


FIG. 10. Presence ● and absence ● of *Idioctis ferrophila* sp.nov. at coastal localities sampled in New Caledonia.

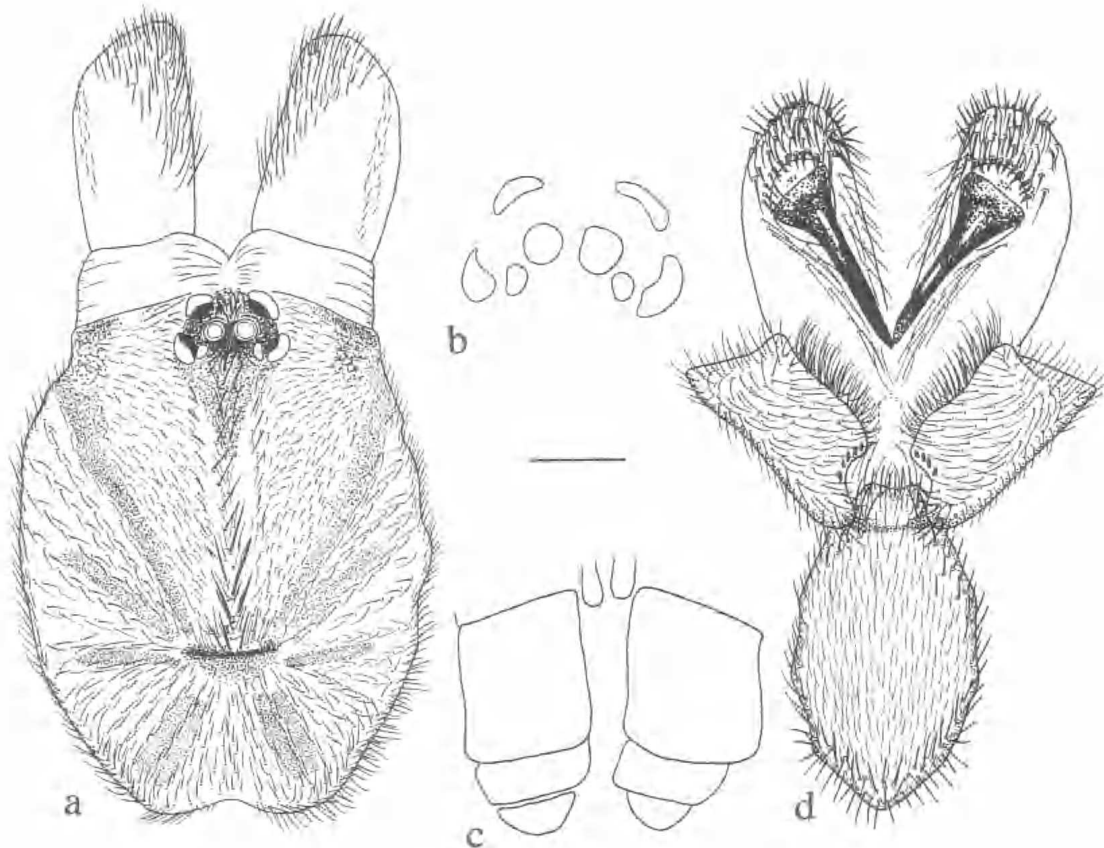


FIG. 11. *Idioctis ferrophila* sp. nov., holotype ♀. a, cephalothorax and chelicerae, dorsal view. b, eyes, dorsal view. c, spinnerets, ventral view. d, sternum, maxillae, and labium, ventral view. Scale line = 1mm (a, d), 0.5mm (b, c).

Furrow promargin with 7 thick teeth, basomesally with 1 minute and three small teeth.

**Labium.** 0.88 wide, 0.44 long. Labiosternal suture a narrow groove.

**Maxillae.** 1.52 long in front, 2.16 long behind, 1.04 wide; with c.4-6 cuspules on inner edge. Heel distinct; anterior lobe, indistinct.

**Sternum.** 2.80 long, 1.88 wide. With slightly darker and thicker hairs on margin; otherwise fine grey hairs medially. Sigilla shallow, indistinct.

**Legs.** Formula 4123. I, II thicker than III, IV.

TABLE 3. Leg measurements of *Idioctis ferrophila*, holotype ♀

	I	II	III	IV	Palp
Femur	2.88	2.68	2.08	3.08	2.24
Patella	2.40	2.16	1.52	2.24	1.68
Tibia	2.08	2.04	1.36	3.28	1.36
Metatarsus	1.60	1.52	1.36	2.44	
Tarsus	1.12	1.12	0.80	0.88	1.44
Total	10.08	9.52	7.12	11.92	6.72

Covered with fine grey hairs mixed with black setae; fine 'furry' grey hairs form narrow band near trichobothria on tibiae and metatarsi. Metatarsi I, II with distinct darker pair of setae distoventrally. Thorn spines: c.30 on prolateral patellae III, c.11 small on proximal prodorsal patella IV.

**Scopula.** Metatarsi and tarsi I, II, full, entire but not obscuring cuticle and separate hairs distinct. Metatarsi: III, one wide band prolaterally, ventrally and retrolaterally with setae and spines; IV, absent. Tarsi: III, full, parted by band 6-8 setal rows wide; IV, only small cluster in proximal proventral corner.

**Spines.** True spines only ventrally on palpal tibiae and distal metatarsi III, IV; 6-8 thicker setae on dorsal femora. Leg 1, 2: none except tibia v2 (w) and v4, respectively. Leg 3: thorn spines plus, ti v6 (w), me v8 on distal edge plus 1 thick and 4 thinner medially. Leg 4: thorn spines plus, tibia v7

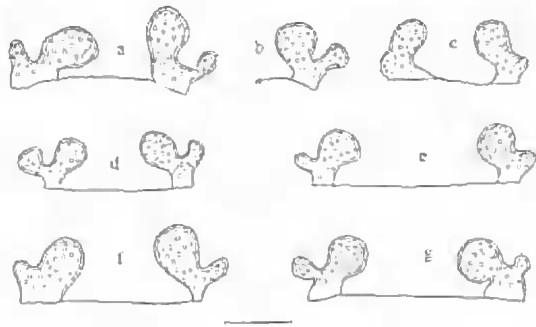


FIG. 12. *Idiactis ferrophila* sp.nov., dorsal view of spermathecae of ♀♀. a, S7211. b, S12513. c, S12517. d, S12511. e, S12512. f, S13538. g, S13537. Scale line = 0.25mm.

(w); me, v8 distal (4 close enough to be almost a comb) and 3 thinner proximad. Palp, ti v5.

**Claws.** 5 short (leg I) to 3 (leg IV) teeth on paired claws, palpal claw bare. Tufts dense, not enclosing claws, divided.

**Trichobothria.** In 2 rows, each of c.6 for 3/4 of length of tibiae; c.6-7 in short diagonal row on metatarsi; 5 clavate and c.14 filiform on tarsi in two triangular bands. Trichobothria associated with fine grey hairs.

**Spermathecae.** Two, each with two lobes, medial lobe broad, lateral lobe small digitiform.

**Spinnerets.** PMS 0.22 long, 0.08 wide, 0.08 apart, c.0.12 of basal PLS in diameter. PLS length of basal, middle, apical, and total articles = 0.76, 0.22, 0.18, 1.92, respectively.

**DISTRIBUTION AND HABITAT**

*Idiactis ferrophila* is known from ironstone boulders on the beach at Port Boisé at the south eastern corner of New Caledonia. A trapdoor burrow with a spider like that of *Idiactis* was noted in intertidal rocks just south of Goro, 5-7 km east of Port Boisé. The specimen was not collected. At both locations, the boulders and rocks had water around their bases at low tide.

**ETYMOLOGY**

The specific epithet is latin derived for iron (*ferros*) and greek love (*philos*) and relates to the original collection of this species from only ironstone boulders in southern New Caledonia.

***Idiactis talofa* sp.nov.**  
(Figs 2, 13-15, Table 4)

**MATERIAL EXAMINED**

**HOLOTYPE:** ♀, Upolu, 13°55'S, 172°45'W, close to

high tide mark, Western Samoa, B. J. Marples, BMNH 1974.129.1.

**PARATYPES:** 2♀♀, Upolu, 13°55'S, 172°45'W, close to high tide mark, Western Samoa, B. J. Marples, BMNH 1974.129.2. 14♀♀ and eggs from Nu'ulopa Islet, Western Samoa, B. J. Marples, BMNH 1974.135. 1♀, 'Samoa', 19.ii.1882, Kauf, Godeffroy collection in NHW.

**DIAGNOSIS**

Spermathecae two, each consisting of two similarly sized lobes, one lobe pointed. 18-20 thorn spines on prolateral proximal corner of patella III; c.9 on patella IV; prolateral distal corner of femur IV with 2-3 short spines. 4 teeth on all paired claws. Preening combs absent. Rastellum is 11 thick curved spines in single line with bases touching.

**HOLOTYPE FEMALE**

Carapace 5.00 long, 4.08 wide. Abdomen 7.17 long, 4.00 wide. Total length, 15.

**Colour in alcohol.** Carapace orange brown, darker on caput, legs orange brown. Abdomen dorsally pallid with purplish tinge and ventrally pallid.

**Carapace.** With light uniform covering of silvery brown hairs, none in striae, light bush on margins, numerous brown bristles beside 10 thick and several smaller anteromedial bristles, 6-8 thick bristles between PME, c.10 between AME. Fovea distinctly procurved; clypeus absent.

**Eyes.** Tubercle low, distinct. AME pigmented. Group occupies 0.35 of head-width. Three rows; front row widely separated from middle row, back row slightly procurved. Eye group front width, back width, length = 40:52:33. MOQ front width, back width, length = 24:35:19. AME:ALE:PME:



FIG. 13. Localities of *Idiactis talofa* sp.nov. in Western Samoa ➤.

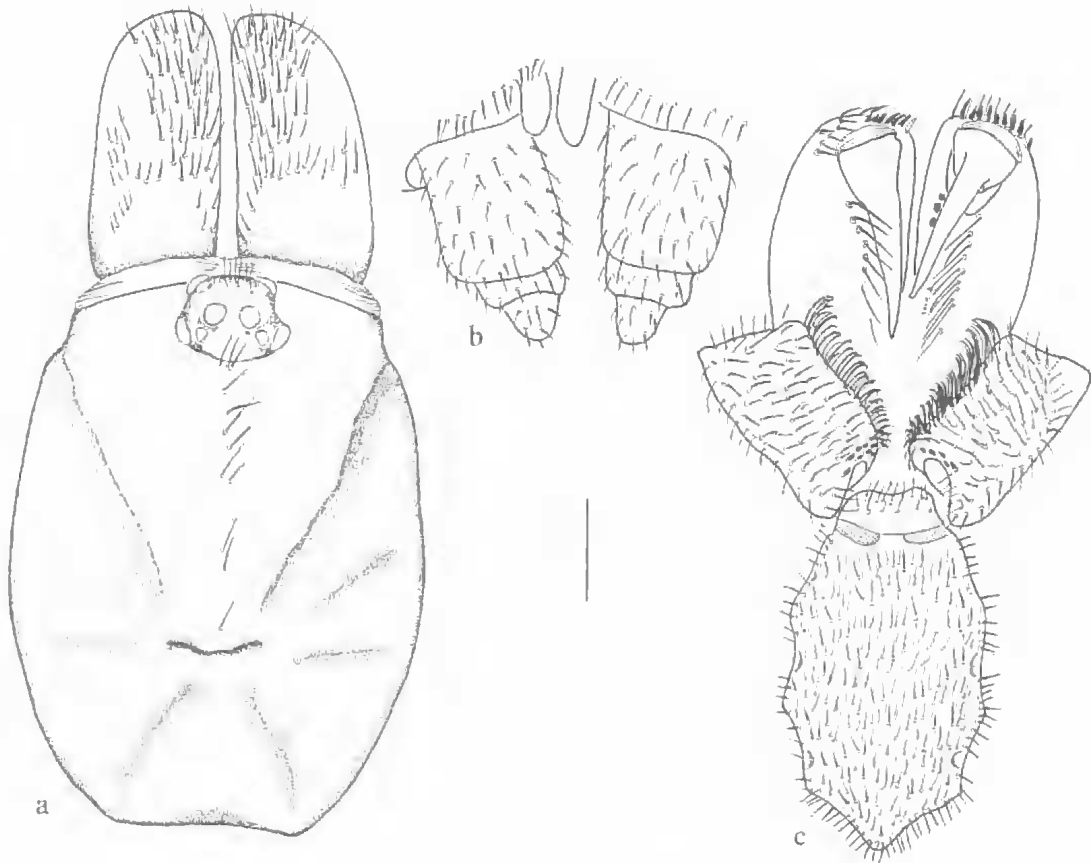


FIG. 14. *Idioctis talofa* sp. nov., holotype ♀. a, cephalothorax and chelicerae, dorsal view. b, spinnerets, ventral view. c, sternum, maxillae, labium and chelicerae, ventral view. Scale line = 1mm (a, c), 0.5mm (b).

PLE = 10:12:8:14. Interspaces: AME-AME, 0.5, AME-ALE, 1.0, ALE-ALE, 1.9, PME-PLE, 0.2, PME-PME, 2.4, ALE-PLE, 1.3.

**Chelicerae.** Band of moderately long brown bristles prodorsally and narrower band laterally. Rastellum is c.11 thick curved spines in single line hanging over long cheliceral edge, with bases touching. Furrow promargin with 8 teeth, all bases separate but most anterior teeth bases very close, basomesally with 6 small teeth.

**Labium.** 0.92 wide, 0.84 long. Separated from sternum by narrow groove.

**Maxillae.** 1.44 long in front, 1.96 long behind, 1.20 wide; with 5-8 pointed cuspules on inner angle. Heel rounded; anterior lobe just distinct.

**Sternum.** 3.24 long, 1.96 wide. Widest between coxae I. Sigilla small, marginal, indistinct.

**Legs.** With uniform covering of moderately long brown hairs. Scopula. Metatarsi and tarsi I, II entire, full; metatarsi III, only on proventral face;

metatarsi IV absent; tarsi II with narrow band of 4-6 rows parting scopula; tarsi IV thin, short hairs, only on proventral face. Thorn spines: 18-20 on prolateral proximal corner of patella III; c.9 on patella IV; prolateral distal corner of femur IV with 2-3 short spines. Preening combs absent.

**Claws.** All paired claws with 4 distinct teeth; palpal claw bare. Claw tufts not enclosing claws.

**Spines.** No true spines dorsally or laterally except for femora and patellae III, IV. Spines on ventral legs generally weak, strong only on distal metatarsi III and IV but no so close as to form comb. Leg 1: ti p3, me 0. Leg 2: ti v3, me v1. Leg 3: pa p18, ti v6w, me v9. Leg 4, fe p3, pa p6, ti v8w, me v5 short plus 4-6 thinner. Palp: ti p1, v4.

**Trichobothria.** In two rows, each of c.11 for 3/4 of tibiae; c.9 in curving row on metatarsi; 3 clavate and c.15 filiform on tarsi.

**Spermathecae.** Two, each consisting of two similarly sized lobes, one lobe pointed.

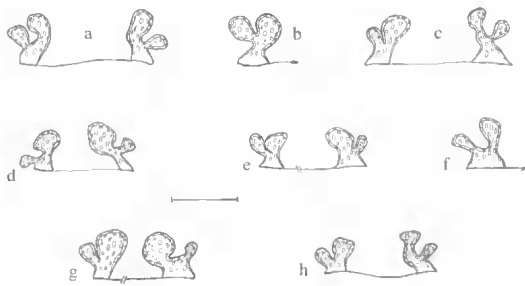


FIG. 15. *Idiocris talofa* sp.nov., dorsal view of spermathecae of ♀ ♀, a-h. Scale line = 0.25mm.

*Spinnerets.* PMS 0.36 long, 0.12 wide, bases 0.06 apart, c.0.19 of basal PLS in diameter. PLS basal, middle, apical, and total article lengths = 0.74, 0.26, 0.18, 1.18, respectively.

**DISTRIBUTION AND HABITAT**

Known from laval rock on beaches on the island of Upolu, and the islet of Nu'ulopa, Western Samoa (Marples, 1955).

**ETYMOLOGY**

The specific epithet is a Samoan word meaning 'welcome', in appreciation of the warm reception given to TBC.

**REMARKS**

Differs from *I. helva* in the spermathecal lobes being equal in size, anterior most teeth in cheliceral margin not fused basally, and has 1-2 thorns on prolateral distal femur IV. Of the 17 adults examined, one from 'Upolu' has only 4-6 spines on prolateral patella III of both legs. In all others, the number varies from 10-20 on a single specimen.

***Idiocris marovo* sp.nov.**  
(Figs 2, 16-18, Table 5)

**MATERIAL EXAMINED**

**HOLOTYPE:** ♀, Uepi Island, Marovo Lagoon, Western Province, Solomon Islands, Western Pacific, 8°27'S, 157°56'E, intertidal limestone beach rock, 7.vii.1990, T.B. Churchill, QM S17121.

**PARATYPE:** 5 ♀ ♀, same data as holotype, 7.vii.1990, T.B. Churchill, QM S17118-20, QM S17122, QM S17123.

**DIAGNOSIS**

Spermathecae two, each consisting of large terminally enlarged lobe with smaller one attached to the outer base of the former. Thorn spines: 25

TABLE 4. Leg measurements of *Idiocris talofa*, holotype ♀

	I	II	III	IV	Palp
Femur	3.36	2.80	2.36	3.42	2.52
Patella	2.28	2.16	1.72	2.58	1.64
Tibia	2.12	1.96	1.64	3.17	1.36
Metatarsus	1.64	1.40	1.28	2.75	
Tarsus	0.88	1.08	0.80	1.00	1.32
Total	10.28	9.40	7.80	12.92	6.84

on prolateral proximal corner of patella III; 10-16 on patella IV; prolateral distal corner of femur IV with 5 short spines. 2-4 teeth on paired claws. Rastellum of 10 strong spines in single line with bases touching. Preening combs a whorl of spines on metatarsi III, IV. ♂ ♂ unknown.

**HOLOTYPE FEMALE**

Carapace 3.92 long, 2.96 wide. Abdomen 5.28 long, 2.96 wide. Total length, 12.

*Colour in alcohol.* Carapace yellow brown, orange brown on caput; legs yellow brown; chelicerae red brown. Abdomen pallid but dorsally with two purple brown markings at anterior and posterior ends.

*Carapace.* With light uniform covering of silvery brown hairs, none in striae; light bush on margins; numerous brown bristles beside 10 thick and several smaller anteromedial bristles, 6-8 thick bristles between PME, c.10 between AME. Fovea very slightly procurved.

*Eyes.* Tubercle low, distinct. AME pigmented. Group occupies 0.48 of head-width. Three rows; front row widely separated from middle row, back row straight. Eye group front width, back width, length = 32:40:27 MOQ front width, back width, length = 21:27:13. AME:ALE:PME:PLE = 8:12:6:13. AME-AME, 0.8, AME-ALE, 0.9, ALE-ALE, 1.3, PME-PLE, 0.1, PME-PME, 1.9, ALE-PLE, 0.9

*Chelicerae.* Band of stiff silver bristles prodorsally and two narrow bands retrolaterally. Rastel-

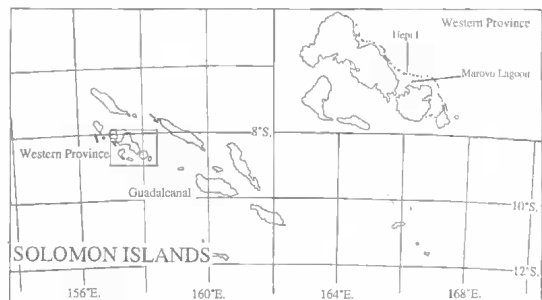


FIG. 16. Location of *Idiocris marovo* sp.nov. at Uepi Island in the Western Province (inset), Solomon Is.

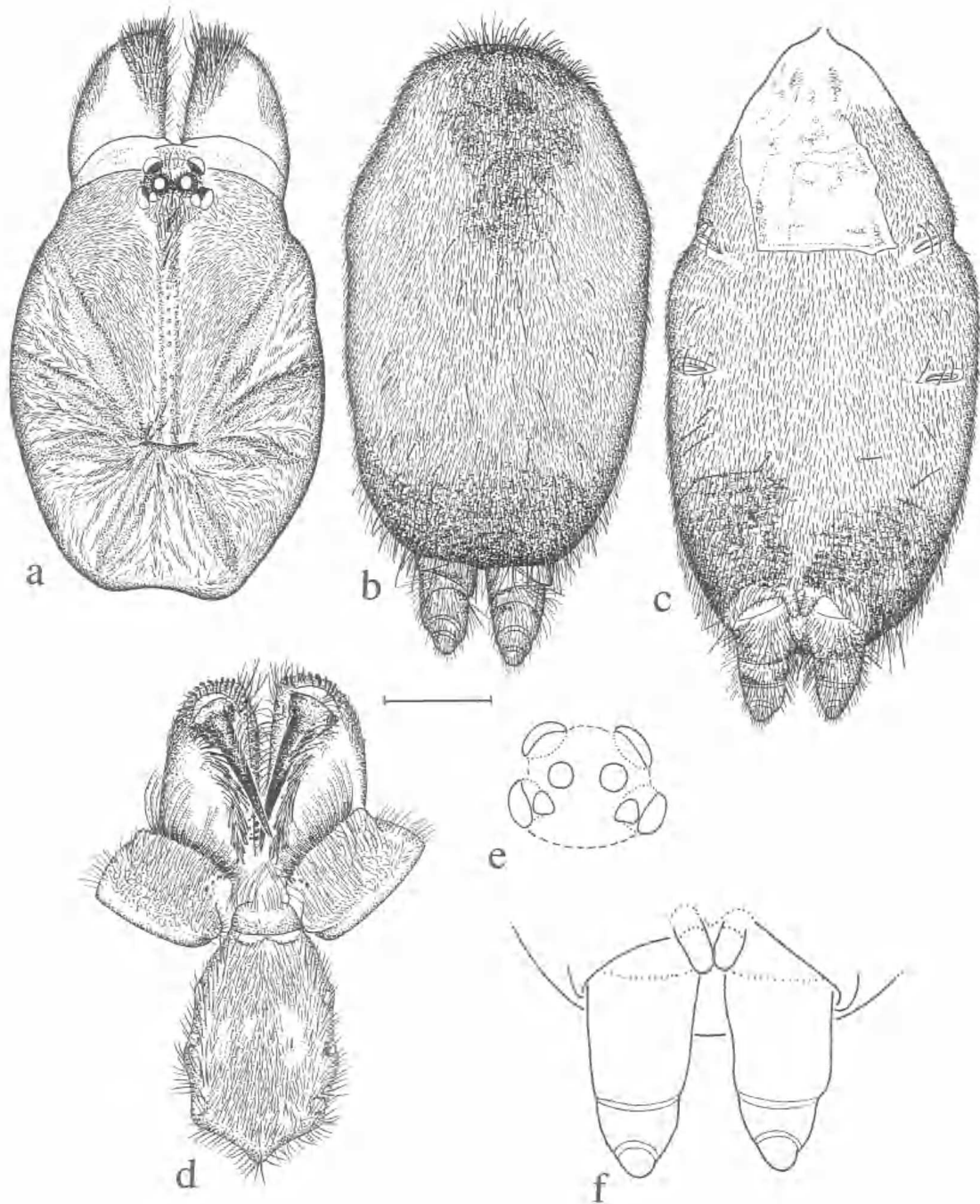


FIG. 17. *Idioctis marovo* sp.nov. holotype ♀. a, cephalothorax and chelicerae, dorsal view. b, abdomen, dorsal view. c, abdomen, ventral view. d, sternum, maxillae, labium and chelicerae ventral view. e, eyes, dorsal view. f, spinnerets, ventral view. Scale line = 1 mm (a-d), 0.5 mm (e, f).

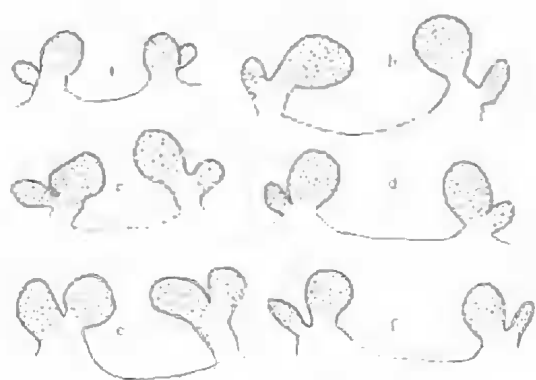


FIG. 18. *Idiactis marovo* sp.nov., dorsal view of spermathecae of ♀♀. a, S17119. b, S17123. c, S17122. d, S17121. e, S17120. f, S17118. Scale line = 0.25mm.

lum of 10 strong spines in single line with bases touching overhang cheliceral edge. Furrow promargin with 7 teeth, all bases separate but most anterior teeth bases very close, basomesally with 4 small teeth.

*Labium.* 0.64 wide, 0.28 long. Separated from sternum by distinct narrow groove.

*Maxillae.* 1.00 long in front, 1.44 long behind, 0.76 wide; with 5 pointed cuspules on inner angle. Heel rounded; anterior lobe just distinct.

*Sternum.* 2.24 long, 1.52 wide. Sigilla small, oval, and marginal, increasing in size posteriorly.

*Legs.* With uniform covering of moderately long brown hairs. Scopula: metatarsi and tarsi I, II, entire, full; metatarsi III, only on proventral face; tarsi III, with band of 4-6 rows of setae parting scopula; metatarsi and tarsi IV absent. Thorn spines: 25 on prolateral proximal corner of patella III; 10-16 on patella IV; prolateral distal corner of femur IV with 5 short spines. Preening combs a whorl of spines on metatarsi III, IV.

*Spines.* No true spines dorsally or laterally but 3-5 long fine black setae on femora I. Spines on ventral legs generally weak, strong only on distal metatarsi III and IV but no so close as to form comb. Leg 1: fe 0, pa 0, ti v2w, me 0. Leg 2: fe 0, pa 0, ti v2, me v1w. Leg 3: fe 0, pa p24 thorn

spines, ti v2w, me v10. Leg 4: fe p5 thorn spines, pa p10-16, ti 0, me v7 in distal whorl. Palp, ti r1, v4 + 3w.

*Claws.* Paired claws with 2-4 distinct teeth; palpal claw bare. Claw tufts just enclosing claws.

*Trichobothria.* In two rows, each of c. 11 for 3/4 of tibiae; c.15 in curving row that splits into two rows for the distal half on metatarsi; 6 clavate and c.16 filiform that split into two rows each two wide, two centrally and distally, on tarsi.

*Spermathecae.* Two, each consisting of large terminally enlarged lobe with smaller one attached to the outer base of the former.

*Spinnerets.* PMS 0.26 long, 0.14 wide, bases 0.06 apart, c.0.30 of basal PLS in diameter. Basal, middle, apical, and total article lengths of PLS = 0.74, 0.12, 0.14, 1.00, respectively.

DISTRIBUTION AND HABITAT

Known from limestone beach rock and the root bases of coconut trees in the littoral zone on the island of Uepi, in the Marovo Lagoon, Western Province, Solomon Islands.

ETYMOLOGY

The specific epithet is taken from Marovo Lagoon, Solomon Islands (where the spiders were collected), which has been nominated for World Heritage listing. In the face of increasing pressure from mining and logging activities, its pristine state is a credit to the wisdom of the local people.

REMARKS

Females of *I. marovo* differ from those of all other species except *I. eniwetok* in that patella III is clearly shorter than tibia III, and from *I. eniwetok* in the presence of numerous thorn spines on patella IV.

*Niho*a gen.nov. Raven & Churchill

DIAGNOSIS

*Niho*a can be distinguished from *Idiactis* by the wider sternum, the medially located teeth on the paired claws of ♀♀ and the absence of a second row of teeth on the claws of ♂♂. The two genera are readily distinguished by the presence of distinct pattern dorsally on the abdomen of *Niho*a. *Niho*a also differs from both *Idiactis* and *Idiophthalma* in the absence of a rastellum and from *Rhianodes* Raven in the absence of a groove on the anterior face of the maxillae.

DESCRIPTION

Carapace hirsute, without pattern. Fovea very

TABLE 5. Leg measurements of *Idiactis marovo*, holotype ♀

	I	II	III	IV	Palp
Femur	4.88	4.64	3.60	5.12	4.16
Patella	3.28	3.12	2.48	3.60	1.84
Tibia	3.28	3.20	2.64	5.36	2.84
Metatarsus	2.56	2.32	2.40	4.16	
Tarsus	2.32	1.60	1.68	1.92	2.08
Total	16.32	14.88	12.80	20.16	10.56

broad, straight to slightly procurved. Abdomen with distinct pattern or mottling. Rastellum absent. Maxillae usually with c.10-20 cuspules on inner anterior corner; anterior lobe indistinct, posterior heel produced. Labium wide, without cuspules. Sternum long, narrow (about 1.4 times longer than wide, rarely narrower), with small, marginal sigilla, if evident. Scopulae (♀ ♀) entire on metatarsi and tarsi I-III, in distal half mixed with setae on metatarsi III, and one small triangle proventrally on metatarsi IV, if present; dense and divided by narrow band of setae.

Spines (rare value in parentheses). Leg 1: femur, p0 d0-4 r0, patella, 0, tibia, p0-1 v2-7, me p0 r0-1. Leg 2: femur, p0 d0-4 r0, patella p0, tibia p0-1 v0-4, metatarsus 0 v1-2. Leg 3: femur p0-1 d0-5 r0, patella p6-30, tibia p0(2) r0(2) v0-7, metatarsus p0-3 r0-3 v0-13. Leg 4: femur p0 d0-7 r0, patella p3-16, tibia p0 d0 r0(2) v0-7, metatarsus p0-7 r0-4 v2-9.

Paired claws of ♀ ♀ with teeth on medial keel; claws of ♂ ♂ with or without one row of teeth. Tarsi with clavate and filiform trichobothria. ♂ ♂: tibia I with prolatral spur and megaspine, more distal prolatral megaspine and associated cuticular 'thumb'; palpal bulb pyriform; embolic tip flanged.

#### TYPE SPECIES

*Nihoa mahina* sp.nov.

#### REMARKS

Raven's (1988) inclusion of *Idiopsis hawaiiensis* in *Idiopsis* was presumably based upon the notion that it was the only genus that could be on such remote islands. He did identify that the species was the sister group of all other *Idiopsis* species but lacked data on the ♂ of the type species to confirm the generic diagnosis.

#### DISTRIBUTION AND HABITAT

Known from Nihoa Island in the northern group of the Leeward Islands from terrestrial habitats.

#### INCLUDED SPECIES

*Nihoa mahina* sp.nov. Nihoa I., Leeward Islands, NW Pacific

*Idiopsis hawaiiensis* (Raven, 1988) Necker I., Leeward Islands, NW Pacific

*Nihoa mahina* sp.nov. Churchill & Raven  
(Figs 19-22, Table 6)

#### MATERIAL EXAMINED

HOLOTYPE: ♂, Nihoa I., 22°10'N, 163°10'W, Leeward

Islands, northwest Pacific Ocean, 40ft. (12.2m) above sea-level, on rocks near camp in moonlight, 15.ii.1981, S. Conant, Bernice P. Bishop Museum.

PARATYPES: ♀ (allotype), Nihoa I., 22°10'N, 163°10'W, Leeward Islands, Hawaii, in sleeping bag, vi.1981, S. Conant; ♀, Nihoa I., 2.ii.1981, drowned in seep pool, S. Conant; ♀, Miller Valley, Nihoa I., vi.1982; all in Bernice P. Bishop Museum.

#### DIAGNOSIS

Paired claws of ♂ ♂ with teeth. Upper cuticular process on tibia I of ♂ ♂ at base of spur. Spermathecae two coniform mounds.

#### HOLOTYPE MALE

Carapace 10.00 long, 9.67 wide. Abdomen 10.00 long, 6.83 wide. Total length, 24.

*Colour in alcohol.* Carapace, legs and chelicerae red brown. Abdomen dorsally yellow brown with medial longitudinal discontinuous band of brown flanked laterally by somewhat paired, brown spots anteriorly and recurved brown bands posteriorly. Abdomen ventrally yellow brown with four small brown marks almost equidistant, centrally. Sternum, maxillae, and labium red brown. Spinnerets yellow brown.

*Carapace.* Fine silvery hairs form uniform covering intermixed with numerous setae; line of 6 thick and several finer anteromedial bristles, and several thick bristles between ALE; striae glabrous. Fovea slightly procurved.

*Eyes.* Tubercle low. Group occupies 0.24 of head width. Eyes in three rows. Eye group: front width, back width, length = 71:82:60. MOQ front width, back width, length = 44:60:31. AME:ALE:PME:PLE = 16:22:16:24. Eye interspaces: AME-AME, 1.1, AME-ALE, 1.0, ALE-

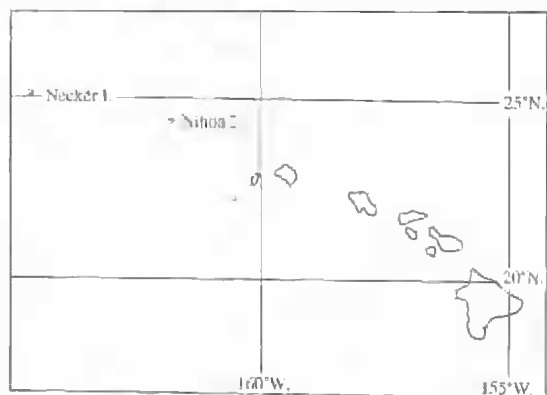


FIG. 19. Localities of *Nihoa* in the Leeward Islands. *N. mahina* sp.nov. on Nihoa I. and *N. hawaiiensis* (Raven) on Necker I.



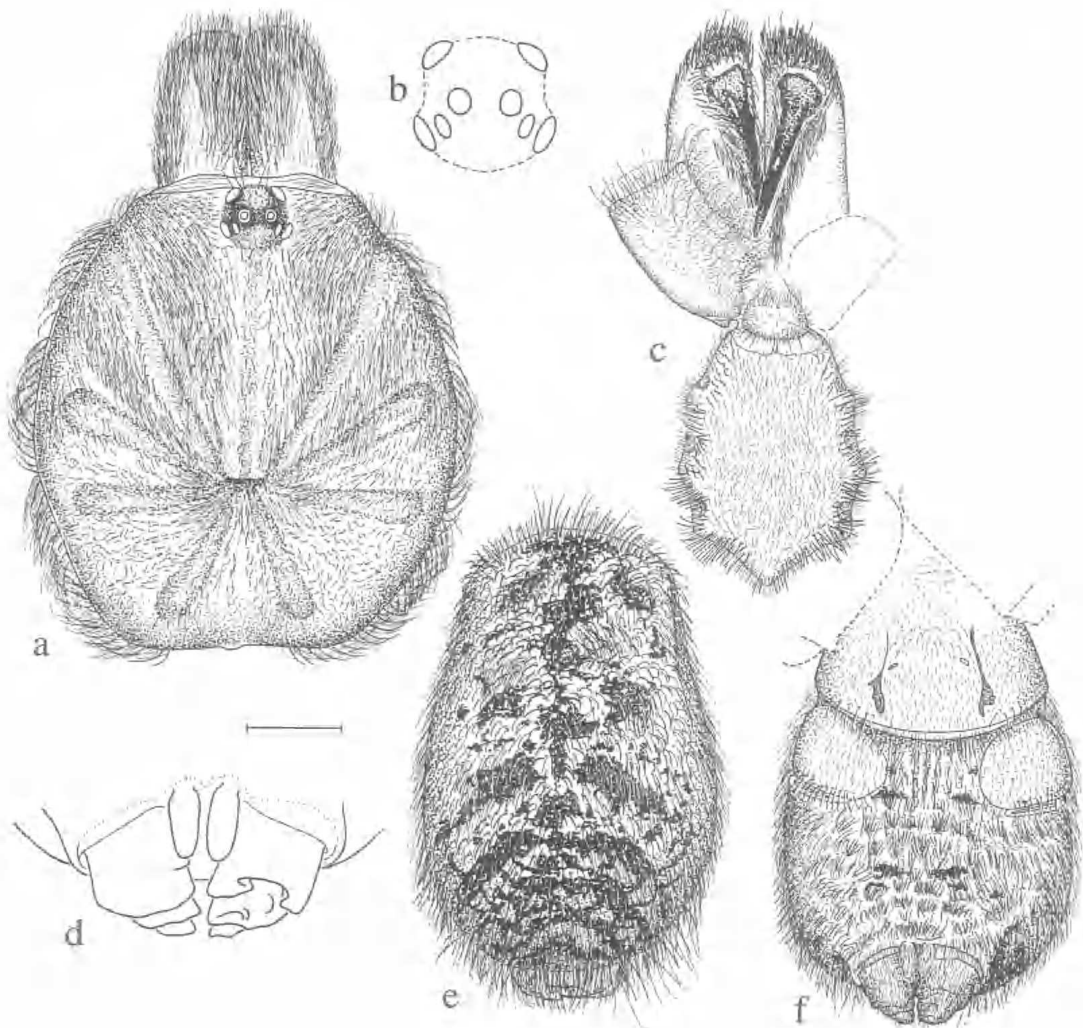


FIG. 20. *Nihoa mahina* sp. nov. holotype ♂. a, cephalothorax and chelicerae, dorsal view. b, eyes, dorsal view. c, sternum, maxilla, labium and chelicerae, ventral view. d, spinnerets, ventral view. e, abdomen, dorsal view. f, abdomen, ventral view. Scale line = 2mm (a, c, e, f), 1mm (b, d).

ALE, 2.3, PME-PLE, 0.1, PME-PME, 2.4, ALE-  
PLE, 1.1.

*Chelicerae.* With prodorsal and lateral bands of setae and fine silver hairs. Rastellum only a line of 20-25 long pointed bristles on distal edge. Furrow promargin with 8 thick teeth and 3 smaller teeth; 12 small teeth basomesally. Intercheliceral tumescence absent.

*Labium.* 1.76 wide, 0.72 long. Labiosternal suture a distinct groove.

*Maxillae.* 2.96 long in front, 3.60 long behind,

1.60 wide; with c. 12 cuspules on inner edge. Heel distinct; anterior lobe indistinct.

*Sternum.* 5.60 long, 4.08 wide. Sigilla marginal, round, and posterior pair largest.

*Legs.* Formula 4123. Tibia I with distal, prolateral spur and short megaspine; base of spur with broad cuticular process below which is one (rarely two) spine. Scopulate surface of tarsi pallid.

*Scopula.* Leg I, full, thick, entire and undivided on metatarsi and tarsi I, II. Leg II scopula extends

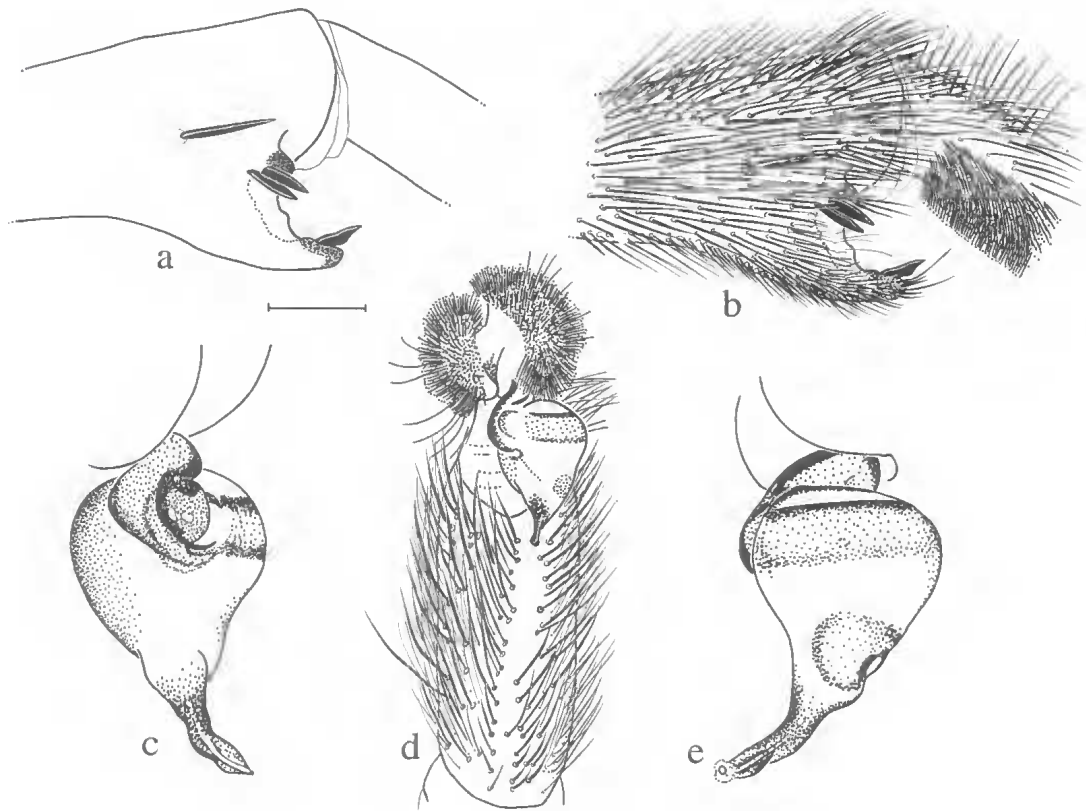


FIG. 21. *Nihoa mahina* sp. nov. holotype ♂. a, tibia I, prolateral view showing distal spur and megaspine, hair and scopula omitted. b, tibia I showing distribution of hair and scopula. c, palpal bulb. d, palpal tibia, cymbium and bulb, ventral view. e, palpal bulb. Scale line = 1mm (a, b, d), 0.5mm (c, e).

to retrolateral side; metatarsi III, thin on distal half extending to prolateral side with setae intermixed; tarsi III, entire, thick with setae intermixed; metatarsi IV, with distal prolateral 1/4 with thin scopulae; tarsus IV with setal band 2-4 rows across intermixed with thin scopulae.

**Spines.** Leg 1: fe p2, pa 0, ti p2+2, v3+2, me 0. Leg 2: fe p2, pa 0, ti p1, v2, me 0. Leg 3: fe p2, r3, pa 0, p2+1w, ti p2, r2, v5, me p4, r5, v10. Leg 4: fe p2, d2, r2, pa 0, ti r5, v10, me p6, r5, v17. Palp: pa 0, ti v1.

**Palp.** Bulb with distally flanged embolus. Cymbium with two deeply divided lobes, retrolateral face slightly concave.

**Claws.** 2-4 (leg I) to 0 (leg IV) teeth in medial keel on paired claws. Tufts dense, enclosing claws.

**Trichobothria.** c.8 for half length of tibia, c.12 on metatarsi in single curving row; two bands each of c.4 small clavate and c.10 filiform on tarsi.

**Spinnerets.** PMS 0.84 long, 0.36 wide, bases

0.32 apart, c.0.33 of basal PLS in diameter. PLS basal, middle, apical, and total article lengths = 1.12, 0.64, 0.52, 2.28, respectively.

#### ALLOTYPE FEMALE

Carapace 10.00 long, 8.33 wide. Abdomen 10.33 long, 7.33 wide. Total length, 25.

**Colour in alcohol.** Carapace and legs orange brown, chelicerae red brown. Abdomen dorsally yellow brown with medial longitudinal discontinuous band of brown, flanked laterally by somewhat paired, brown spots anteriorly and recurved brown bands posteriorly. Abdomen ventrally yellow brown with four small brown marks almost equidistant, centrally. Sternum, maxillae, and labium orange brown. Spinnerets yellow brown.

**Carapace.** Fine silvery hairs form uniform covering intermixed with numerous setae well developed between head region and fovea; striae glabrous; fovea straight; c.30 setae between AME, c.14 between PME, c.40 long setae along medial

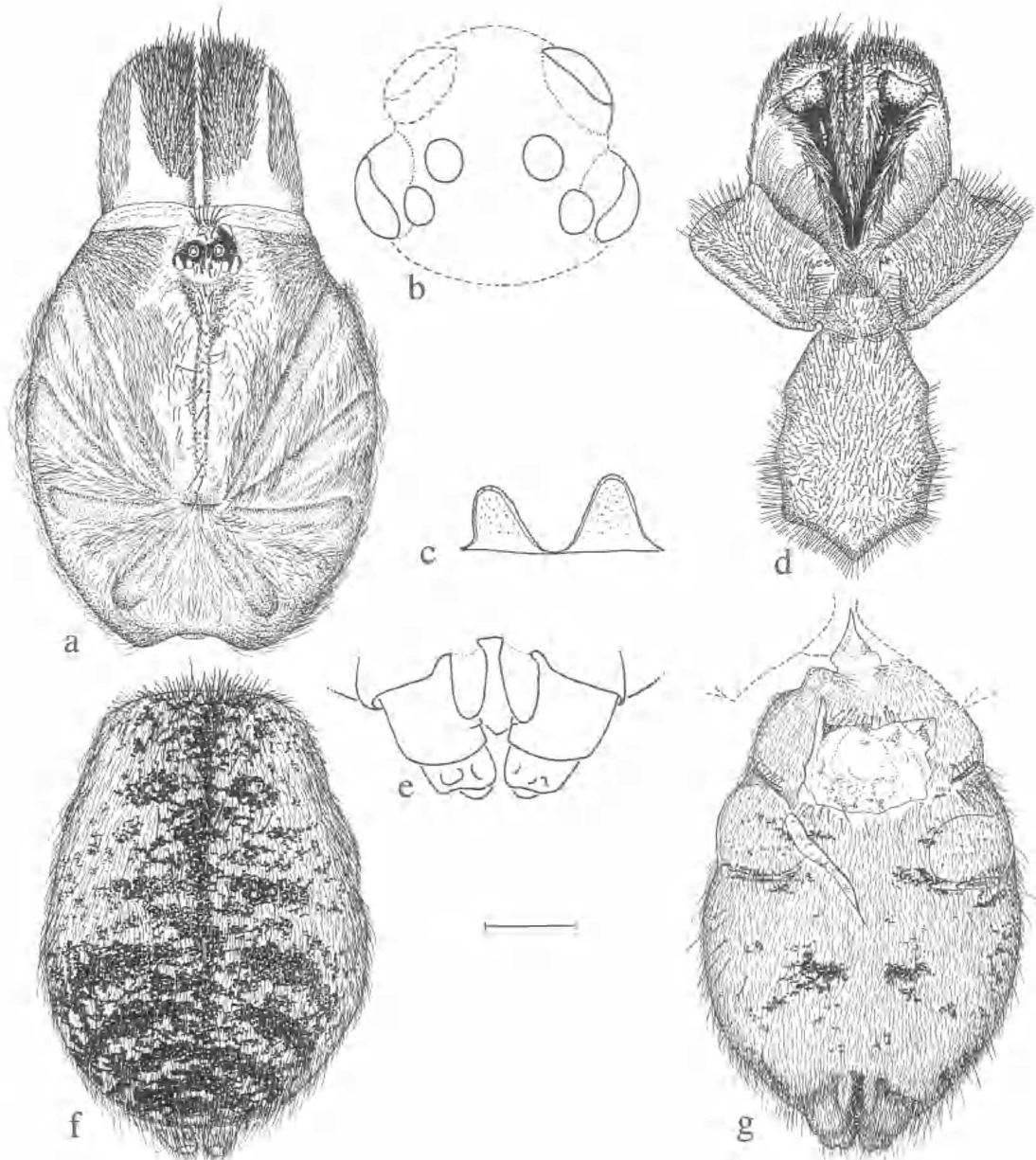


FIG. 22. *Nihoa mahina* sp. nov. paratype ♀, a, cephalothorax and chelicerae, dorsal view. b, eyes, dorsal view. c, spermathecae. d, sternum, maxillae, labium and chelicerae, ventral view. e, spinnerets, ventral view. f, abdomen, dorsal view. g, abdomen, ventral view. Scale line = 2mm (a, d, f, g), 1mm (b, e), 0.5mm (c).

caput; lateral edge of carapace with several anterior and posterior directed lines of setae with dense fine silvery hairs. Clypeus absent.

*Eyes.* Tubercle low. Group occupies 0.30 of head width. Eyes in three rows. Eye group front width, back width, length = 72:81:55. MOQ front width, back width, length = 45:55:35.

AME:ALE:PME:PLE = 20:23:12:25. Interspaces: AME-AME, 0.4, AME-ALE, 0.8, ALE-ALE, 2.6, PME-PLE, 0.1, PME-PME, 1.8, ALE-PLE 0.8.

*Chelicerae.* With prodorsal and lateral bands of setae with fine silver hairs. Rastellum absent, c.35 strong bristles in line on distal edge. Furrow

TABLE 6. Leg measurements of *Nihoa mahina*, holotype ♂

	I	II	III	IV	Palp
Femur	8.33	8.16	6.16	9.50	5.50
Patella	5.33	4.83	4.83	4.83	3.16
Tibia	6.17	5.33	5.00	6.83	3.33
Metatarsus	5.83	5.66	5.33	8.00	
Tarsus	3.50	3.83	2.83	3.16	2.50
Total	29.16	27.81	24.12	32.32	14.49

promargin with 8 thick teeth and 3 smaller teeth; 6 basomesal granules.

*Labium*. 1.76 wide, 1.12 long. Labiosternal suture broad.

*Maxillae*. 2.72 long in front, 3.68 long behind, 1.60 wide; with c.10-12 cuspules on inner edge. Heel angular; anterior lobe, indistinct.

*Sternum*. 5.44 long, 3.76 wide. Sigilla: anterior and medial pair not evident; posterior pair small, round, marginal.

*Legs*. Thorn setae and preening combs absent. Tarsi broad, tarsi I c.60% of length wide; tarsi IV distally incrassate, distal width c.1.4 times basal width.

*Scopula*. Very dense on legs I, II: metatarsi and tarsi I, II, full, thick, entire, undivided; metatarsi III, thin on distal half with thick setae intermixed; tarsi III, entire, thick with 3-5 setae intermixed; metatarsi IV, thin in distal prolateral 1/4, divided; tarsi IV, thick, full, divided by narrow setal band 2-4 rows across and few setae intermixed, setal brush dense distally.

*Spines*. Leg 1, 0. Leg 2: 0, save ti p1. Leg 3: fe p2w, r2w, pa p2 thorns, ti p2, r1, v3, me p3, r3, v7. Leg 4: fe 0, pa 0, ti r1, v4, me p2, r1, v9. Palp, fe p1w, pa 0, ti p3w, v6w.

*Claws*. 4 (leg I) to 0 (leg IV) teeth on paired claws on medial keel. Tufts dense, just enclosing claws. Palpal claw very small, curved, bare.

*Trichobothria*. In two rows each of c.8 for half length of tibia; c.11 on metatarsi in single curving row; c.3-5 clavate and 12-14 filiform in each of two bands on tarsi.

*Spermathecae*. Two coniform mounds.

*Spinnerets*. PMS 0.96 long, 0.44 wide, bases 0.16 apart, c.0.53 of basal PLS in diameter. PLS basal, middle, apical, and total article lengths = 1.12, 0.44, 0.48, 2.04, respectively.

#### DISTRIBUTION AND HABITAT

Known only from the island of Nihoa in the Leeward Islands, northwest of Hawaii.

#### ETYMOLOGY

The generic name refers to the type locality. The species name is a Hawaiian word for moon, given

TABLE 7. Leg measurements of *Nihoa mahina*, allotype ♀

	I	II	III	IV	Palp
Femur	6.66	6.50	5.66	7.33	5.00
Patella	4.66	4.16	3.50	4.66	3.50
Tibia	3.83	4.00	3.33	5.50	2.66
Metatarsus	3.50	3.16	3.50	5.33	
Tarsus	2.00	2.33	1.83	2.66	3.16
Total	20.65	20.15	17.82	25.48	14.32

that the type specimen was collected in the moonlight.

#### REMARKS

Males of *N. mahina* differ from those of *N. hawaiiensis* in the presence of teeth on the claws of leg I and in the basal position of the cuticular process on tibia I. Females differ in the coniform spermathecae, in having 4, rather than 2, teeth on the claws of leg I, and in the darker abdomen dorsally.

#### *Nihoa hawaiiensis* (Raven), new comb. (Fig. 19)

*Idiopsis hawaiiensis* Raven, 1988:6; Platnick, 1989:93.

#### MATERIAL EXAMINED

HOLOTYPE: ♂, Necker I., Leeward Islands, north-west Pacific, 23°35'N, 164°42'W, E. H. Bryan Jr, 29.vi.1923, AMNH.

PARATYPE: ♀, same data as holotype, AMNH.

#### OTHER MATERIAL

The types and also from Necker I., Leeward Islands: ♂, 23.vi.1982, S. Conant, 4♀♀, Annex Hill, alt. 82m., 24.vi.1984, S. Conant; all in Bernice P. Bishop Museum, Hawaii.

#### DIAGNOSIS

Paired claws of ♂♂ without teeth. Upper cuticular process on tibia I of ♂♂ prolateral, well above spur. Spermathecae two long domed mounds.

#### DISTRIBUTION, BURROW AND HABITAT

The spiders were found under rocks in burrows on very sparsely vegetated hillsides on Necker Island, one of the Leeward Islands, northwest of Hawaii.

#### SPERMATHECAL VARIATION IN *IDIOPTIS*

This paper includes the first documentation of spermathecal variation in a genus of the family Barychelidae. Shape of spermathecae has been

used widely in mygalomorphs to distinguish between species (e.g., Schiapelli & Gerschman de Pikelin, 1962; Forster & Wilton, 1968; Raven, 1984a). As such, spermathecal shape has been considered a relatively stable and useful diagnostic character. Rarely are exceptions well supported. In his excellent and detailed revision of *Euagrus*, Coyle (1988) showed extensive variation in the shapes of spermathecae of one species, *E. mexicanus*. On the other hand, Raven (1984b, 1990) found in the *Aname maculata* group (Nemesiidae) and *Trittame* (Barychelidae), respectively, that spermathecae are almost constant within a species group. Moreover, Raven & Churchill (1991) noted that one shape is widespread in barychelid genera and may be the family synapomorphy.

Among mygalomorphs, barychelids have received little attention from taxonomists or ecologists, presumably because they build cryptic burrows. They are also under-represented in museum collections. Hence, from the limited material available variation in shape of spermathecae has been unclear but assumed to be minimal. In *Idioctis*, we find that this variation is usually too great to be useful as a specific character on its own, even though it was stable in species of *Encyocrypta*.

Recognition of a number of species in which the shape of the spermathecae cannot be diagnostic may seem unwarranted. In a major revision of Pacific barychelids (Raven & Churchill, in prep.), a plesiomorphic spermathecal shape has been identified and found to be widespread. However, as with *Idioctis*, barychelid males do show mutually exclusive differences where none were evident among their (unequivocally) conspecific females. Hence, interspecific differences can be sufficiently clarified with non-sexual somatic characters.

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#### LITERATURE CITED

- ABRAHAM, H.C. 1924. Some mygalomorph spiders from the Malay Peninsula. *Proceedings of the Zoological Society of London* 1924: 1091-1124.
- BEATTY, J.A. & BERRY, J.W. 1988. The spider genus *Paratheuma* Bryant (Araneae: Desidae). *Journal of Arachnology* 16(1): 47-54.
- BENOIT, P.L.G. 1966. Les Barychelidae-Barychelinae africains et malgaches (Aran.-Orthogn.). *Revue de Zoologie et de Botanique Africaine* 74(3-4):209-241.
1978. Contributions à l'étude de la faune terrestre des îles granitiques de l'archipel des Séchelles Mission P. L. G. Benoit-J. J. Van Mol 1972 (Araneae Orthognatha). *Revue Zoologique Africaine* 92(2):405-420.
- BENOIT, P.L.G. & LEGENDRE, R. 1968. Un barychélide nouveau du Madagascar: *Atrophonysia intertidalis* gen. sp.nov. (Araneae-Orthognatha). *Revue de Zoologie et de Botanique Africaine* 77(3-4):329-334.
- BONNET, P. 1957. 'Bibliographia Araneorum.' (Douladoure: Toulouse). 2 (3rd part): 1927-3026.
- BRIGNOLI, P.M. 1983. 'A catalogue of the Araneae described between 1940 and 1981', (Manchester: British Arachnological Society). i-xii, 1-755.
- COYLE, F.A. 1971. Systematics and natural history of the mygalomorph spider genus *Antrodiaetus* and related genera (Araneae: Antrodiaetidae). *Bulletin of the Museum of Comparative Zoology* 141: 269-402.

1988. A revision of the American Funnel-web mygalomorph spider genus *Euagrus* (Araneae, Dipluridae). *Bulletin of the American Museum of Natural History* 187:203-292.
- FORSTER, R.R. & WILTON, C.L. 1968. The spiders of New Zealand. Part II. Ctenizidae, Dipluridae and Migidae. *Otago Museum Bulletin* 2:1-180.
- HOGG, H.R. 1901. On Australian and New Zealand spiders of the suborder Mygalomorphae. *Proceedings of the Zoological Society of London* 1901(2):218-279.
- KOCH, L. 1874. 'Die Arachniden Australiens, nach der Natur beschrieben und abgebildet'. Vol.1, pp.473-576. (Raspe: Nürnberg).
- MAIN, B.Y. 1985. Mygalomorphae. In Walton, D.W. (ed.), 'Zoological Catalogue of Australia, 3. Arachnida: Mygalomorphae, Araneomorphae in part, Pseudoscorpionida, Amblypygi, and Palpigradi'. (Australian Government Publishing Service:Canberra). i-x + 1-183.
- MARPLES, B.J. 1951. Mygalomorph spider in Samoa. *Nature*, London 168:300-301.
1955. Spiders from Western Samoa. *Journal of the Linnean Society of London, Zoology* 42:453-504.
- PLATNICK, N.I. 1989. 'Advances in Spider Taxonomy 1981-1987: A supplement to Brignoli's *A catalogue of the Araneae described between 1940 and 1981*'. (Manchester University Press: Manchester). i-vii + 1-673.
- POCOCK, R.I. 1903. On the geographical distribution of spiders of the order Mygalomorphae. *Proceedings of the Royal Society of London* 24(1):340-368.
- RAINBOW, W.J. 1911. A census of Australian Araneidae. *Records of the Australian Museum* 9(2):107-319.
- RAVEN, R.J. 1984a. The Australian curtain-web spiders (Ischnothelinae: Dipluridae: Cheliccrata). *Australian Journal of Zoology, Supplementary Series* 93:1-102.
- 1984b. A revision of the *Aname maculata* species group (Dipluridae, Araneae) with notes on biogeography. *Journal of Arachnology* 12:177-193, tables 1-5.
1985. The spider infraorder Mygalomorphae (Araneae): cladistics and systematics. *Bulletin of the American Museum of Natural History* 182:1-180, tables 1-9.
1988. A revision of the mygalomorph spider genus *Idioctis* (Araneae, Barychelidae). *American Museum Novitates* 2929: 1-14.
1990. A revision of the Australian spider genus *Tritatame* Koch (Mygalomorphae: Barychelidae) and a new related genus. *Invertebrate Taxonomy* 4: 21-51.
- RAVEN, R. J. & CHURCHILL, T.B. 1991. A revision of the mygalomorph spider genus *Encyocrypta* Simon in New Caledonia (Araneae: Barychelidae). In Chazeau, J. and Tillier, S. (eds), 'Zoologica Neocaledonica'. 2. Mémoires du Muséum national d'Histoire naturelle, A, 149:31-86.
- ROEWER, C.F. 1942. *Katalog der Araneae*. (Paul Budy Bd.: Bremen) 1:i-viii + 1-1040.
- SCHIAPELLI, R. D. & GERSCHMAN DE PIKELIN, B. S. 1962. Importancia de las espermatecas en la sistematica de las arañas del suborden Mygalomorpha. *Physis (Buenos Aires) Secc. C*, 23 (64):69-75.
- SIMON, E. 1892. 'Histoire naturelle des araignées'. 1(1):1-256. (Roret: Paris).
1903. 'Histoire naturelle des araignées'. 2(4) Supplément Général :875-1080. (Roret: Paris).